

STREAM ASSESSMENT



MINNESOTA DEPARTMENT OF NATURAL RESOURCES DIVISION OF FISH AND WILDLIFE

Report Date: December 23, 2009

Region	Area	Stream Name	Tributary No.	Stream Length
3	Lake City	East Indian Creek	M-032	10.6 miles
County	Watershed Name, No.	Source (T, R, S)	Mouth (T, R, S)	
Wabasha	Miss. R. – Winona, 40	T109N, R10W, S31	T109N, R9W, S19	

Date(s) of Assessment: Station 7.00 - September 21, 2009

Assessment Purpose: Station 7.00 - Long-term monitoring – brown trout, brook trout, and white sucker populations
Natural reproduction check – brown trout and brook trout populations

Station	Similar Reach	Stream Mile	Length (ft)	Mean Width (ft)	Acres	Water Temp (F)	Air Temp (F)	Downstream UTM's	
								utm _x (↔)	utm _y (↓)
7	2	7.00	687	17.82	0.281	54.5	71	577838	4896292

Summary:

Station 7 on East Indian Creek is one of 23 stations in the Long-Term Monitoring program in southeast Minnesota.

East Indian Creek contains wild populations of brook and brown trout. Adult brook trout abundance was estimated to be 935/mile with 8/mile \geq 10 inches. Recruit brook trout abundance was very high at 4,388/mile. Total brook trout biomass was an estimated 148.92 lbs/acre.

Estimated adult brown trout abundance was 61/mile with 0/mile \geq 12 inches. Recruit abundance was 205/mile and total biomass was 12.82 lbs/acre.

White sucker abundance was estimated at 31 adults/mile and 0 recruits/mile.

Fishery Characteristics – Population Estimates

Population Metrics

Station	7.0 (LTM)		
Date	September 21, 2009		
Gear	Barge (Research)		
Method	Two pass depletion		
Station length (ft)	687		

Population Estimate in Station, Adults

Species	Number	Wt (lbs)	Number	Wt (lbs)	Number	Wt (lbs)
Brown trout	8	2.60				
95% CI	±0					
Brook trout	122	21.78				
95% CI	±21.51					
Rainbow trout	0	0				
95% CI	-					
Total trout	130	24.38				

Population Estimate in Station, Recruits (YOY or yearlings)

Species	Number	Wt (lbs)	Number	Wt (lbs)	Number	Wt (lbs)
Brown trout	27	1.00				
95% CI	±4.44					
Brook trout	571	20.07				
95% CI	±331.89					
Rainbow trout	0	0				
95% CI	-					
Total trout	598	21.07				

Population Estimate in Station, Total

Species	Number	Wt (lbs)	Number	Wt (lbs)	Number	Wt (lbs)
Brown trout	35	3.60				
Brook trout	693	41.85				
Rainbow trout	0	0				
Total trout	728	45.46				

Population Estimate in Station, White Suckers (LTM stations only)

Species	Number	Wt (lbs)	Number	Wt (lbs)	Number	Wt (lbs)
Adults	4					
95% CI	±0					
Recruits	0					
95% CI	-					
Total white sucker	4					

Fishery Characteristics – Population Estimates (continued)

Population Estimate Summary

Station	7.0 (LTM)								
Date	September 21, 2009								
Species	No/Mile	No/Acre	Lbs/Acre	No/Mile	No/Acre	Lbs/Acre	No/Mile	No/Acre	Lbs/Acre
Brown trout	266	123	12.82						
Adults	61	28	9.25						
≥12 inches	0	0							
95% CI	-	-							
≥14 inches	0	0							
95% CI	-	-							
≥16 inches	0	0							
95% CI	-	-							
Recruits	205	95	3.57						
Brook trout	5,323	2,465	148.92						
Adults	935	433	77.51						
≥10 inches	8	4							
95% CI	±0	±0							
Recruits	4,388	2,032	71.41						
Rainbow trout	0	0	0						
Adults	-	-	-						
≥12 inches	-	-							
95% CI	-	-							
Recruits	-	-	-						
All trout	5,589	2,588	161.74						
Adults	996	461	86.76						
Recruits	4,593	2,127	74.98						

Population Estimate Summary (LTM stations only)

Species	No/Mile	No/Acre	Lbs/Acre	No/Mile	No/Acre	Lbs/Acre	No/Mile	No/Acre	Lbs/Acre
White sucker	31	14							
Adults	31	14							
Recruits	0	0							

Fishery Characteristics – Length Frequency in Station (Actual Catch)

Species	Brown trout	Brook trout	White sucker
Station	7.0 (LTM)	7.0 (LTM)	7.0 (LTM)
Date	September 21, 2009	September 21, 2009	September 21, 2009
Length Class			
0 – 2.9		1	
3.0 – 3.4	1	3	
3.5 – 3.9	1	33	
4.0 – 4.4	5	86	
4.5 – 4.9	9	71	
5.0 – 5.4	9	60	
5.5 – 5.9		11	
6.0 – 6.4		8	
6.5 – 6.9		15	
7.0 – 7.4		19	
7.5 – 7.9		21	
8.0 – 8.4		19	1
8.5 – 8.9	1	13	1
9.0 – 9.4	4	5	
9.5 – 9.9	1	2	1
10.0 – 10.4	2		
10.5 – 10.9		1	
11.0 – 11.4			1
11.5 – 11.9			
12.0 – 12.4			
12.5 – 12.9			
13.0 – 13.4			
13.5 – 13.9			
14.0 – 14.9			
15.0 – 15.9			
16.0 – 16.9			
17.0 – 17.9			
18.0 – 18.9			
19.0 – 19.9			
20.0 – 20.9			
21.0 – 21.9			
22.0 – 22.9			
23.0 – 23.9			
24.0 – 24.9			
25.0 – 25.9			
26.0 – 26.9			
27.0 – 27.9			
28.0 – 28.9			
29.0 – 29.9			
30.0+			
Sample Size	33	368	4

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M-032
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Fishery Characteristics – Non-game species

Species Sampled

Station	7.0 (LTM)		
Date	September 21, 2009		
Length (ft)	687		
Mean Width (ft)	17.82		
Species	Number	Number	Number
Chub, Creek	1		
Stickleback, Brook	21		
Sucker, White	4		

Coldwater Index of Biotic Integrity (Mundahl and Simon 1998) for Station 7 (LTM)

Value	Score	Metric	IBI Rating Guidelines	
278		Total Captured		
5	5	Number of Species	105-120	Excellent
3	5	Number of Coldwater Species	70-100	Good
1	10	Number of Minnow Species	35-65	Fair
1	10	Number of Benthic Species	10-30	Poor
2	5	Number of Tolerant Species	0-5	Very Poor
88.89	5	Percent Salmonids as Brook Trout		
80.58	10	Percent Intolerant Individuals		
98.20	10	Percent Coldwater Individuals		
1.44	5	Percent White Suckers		
90.65	10	Percent Top Carnivores		
195.56	10	Number of Coldwater Individuals per 150m		
3.58	10	Number of Warmwater Individuals per 150m		
	95	TOTAL IBI SCORE (120 maximum)		
	79.17	Percent of maximum score		

Stream Characteristics – Minnesota Stream Habitat Assessment (MSHA) (Fisheries Stream Survey Manual)

MSHA Metric	Component score maximum	Component score of station
Surrounding Land Use	5	4
Riparian Zone	15	8.5
Instream Zone – Substrate	27	16.4
Instream Zone – Cover	17	15
Channel Morphology	36	25
	100	Final score 68.9

Stream
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East Indian Creek
M-032
December 23, 2009

Discussion of Fishery:

Station 7 on East Indian Creek is a Long-Term Monitoring (LTM) station in Wabasha County used to monitor temporal variation in trout population dynamics. The stream is managed for wild brook and brown trout and is not stocked. This station has been assessed every year in the fall since 1980, with an additional fall assessment in 1975, and two spring assessments (Table 1, 2).

The brown trout population had an estimated 61 adults/mile and 205 recruits/mile (Table 1). The number of adults is lower than the 31-assessment mean (406/mile), as well as the number of recruits (mean of 876/mile) (Table 1). There were no brown trout ≥ 12 inches, compared to 69/mile in 2008. The total biomass of brown trout (12.82 lbs/acre) was a lot lower than the 31-year mean of 121.1 lbs/acre.

The brook trout population had an estimated 4,388 recruits/mile, which is very high compared to the 31-year mean (1,553/mile) (Table 2). The estimated adult brook trout (935/mile) was higher than the mean (506/mile), but similar compared to abundance in 2008 (988/mile). It appears the brook trout population has been doing well recently, and is able to produce high numbers of recruits each year. There was an estimated 8 brook trout/mile ≥ 10 inches, compared to 69/mile in 2008. The brook trout biomass (148.92 lbs/acre) was slightly higher than the fall mean (137.7 lbs/acre), but lower than the biomass in 2008 (171.5 lbs/acre).

White sucker abundance was estimated to be 31 adults/mile and 0 recruits/mile (Table 3). In 2008, there were 98 adults/mile and 0 recruits/mile.

The management plan for this reach (2) is to maintain a wild brown and brook trout population averaging 500 fish/mile with 10% of brown trout > 12 inches and 10% of brook trout > 10 inches. The total brown trout population was estimated at 266/mile, but there were no adults were estimated ≥ 12 inches (Table 1). The total brook trout population was estimated at 5,323/mile and less than 0.01% of adults were estimated ≥ 10 inches (Table 2). Therefore, the goal for the total population abundance of brook trout was met, but none of the other goals were met.

East Indian Creek is currently managed with the general southeast Minnesota angling regulation of 5 trout in the daily limit with one of those ≥ 16 inches.

The Coldwater Index of Biotic Integrity (Mundahl and Simon 1998) score in 2009 was 95 (Table 4). This higher score is due to a low number of minnow, benthic, and warmwater species of fish, and a high percentage of coldwater individuals.

In 2009, the MSHA (Minnesota Stream Habitat Assessment) score was 68.9 and reflects the moderate shade and moderate bank erosion (Table 4). Sand was a dominant substrate in all but riffles. Embeddedness was moderate. Cover was extensive and provided by undercut bank, overhanging vegetation, some woody debris, boulders, and large amounts of macrophytes.

Credits and Signatures:

Field Crew:

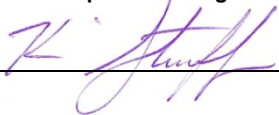
John Hoxmeier, Doug Dieterman, Melissa Konsti, James Melander

Report completed by:

Name:	Title:	Date:
Melissa L. Konsti	Fisheries Specialist	December 23, 2009

Approved by:

Fisheries Supervisor's Signature	Regional Fisheries Manager's Signature	Date:
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Stream
Tributary number
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East Indian Creek
M-032
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Credits and Signatures:

Field Crew:

John Hoxmeier, Doug Dieterman, Melissa Konsti, James Melander

Report completed by:

Name:	Title:	Date:
Melissa L. Konsti	Fisheries Specialist	December 23, 2009

Approved by:


Fisheries Supervisor's Signature	Regional Fisheries Manager's Signature	Date:
		3-6-14

Table 1. Trends in brown trout population metrics for East Indian Creek, years 1975, 1980-2009

Station	River Mile	Similar Reach	Date	No./mile (Adult)	No./mile (Recruits)	No./mile (≥12 in.)	No./mile (≥14 in.)	No./mile (≥16 in.)	lbs/acre (all sizes)
7	7.0	2	9/21/2009	61	205	0	0	0	12.82
7	7.0	2	9/22/2008	186	383	69	8	0	59.25
7	7.0	2	9/24/2007	435	164	23	15	0	68.43
7	7.0	2	10/3/2006	198	1,349	140	32	8	112.83
7	7.0	2	9/26/2005	338	8	56	8	0	79.46
7	7.0	2	9/13/2004	416	256	80	0	0	95.62
7	7.0	2	9/25/2003	852	981	48	0	0	165
7	7.0	2	9/17/2002	683	2,203	60	8	8	178
7	7.0	2	9/19/2001	743	784	75	23	0	167.27
7	7.0	2	9/25/2000	877	1,080	60	8	0	173.6
7	7.0	2	9/23/1999	1,040	1,132	32	0	0	155.6
7	7.0	2	9/25/1998	908	2,048	78	32	16	201.49
7	7.0	2	9/29/1997	242	2,429	101	17	0	121.7
7	7.0	2	9/27/1996	587	228	49	17	0	123.7
7	7.0	2	10/5/1995	917	1,220	42	8	-	206
7	7.0	2	9/30/1994	366	1,168	67	17	-	135
7	7.0	2	9/15/1993	367	983	49	-	-	98*
7	7.0	2	10/22/1992	459	781	-	-	-	105*
7	7.0	2	9/4/1991	331	5,803	-	-	-	71*
7	7.0	2	9/26/1990	83	983	-	-	-	34*
7	7.0	2	10/9/1989	321	83	-	-	-	52*
7	7.0	2	9/26/1988	643	937	-	-	-	107*
7	7.0	2	9/09/1987	325	634	-	-	-	58*
7	7.0	2	9/18/1986	130	300	-	-	-	85*
7	7.0	2	9/4/1985	414	8	-	-	-	131*
7	7.0	2	9/17/1984	276	552	-	-	-	53*
7	7.0	2	9/14/1983	81	336	-	-	-	107*
7	7.0	2	9/7/1982	73	89	-	-	-	24*
7	7.0	2	9/4/1981	162	32	-	-	-	32*
7	7.0	2	1980	64	0	-	-	-	31*
7	7.0	2	10/30/1975	11	5	0	0	0	3.5
			Fall Mean	406	876	57	11	2	121.1
7	7.0	2	3/19/2002	618	730	64	8	8	171.99
7	7.0	2	3/26/1998	380	2009	115	16	0	174.24
			Spring Mean	499	1,370	90	12	4	173.1

NOTE: Estimates were refigured in 2007 and are believed to be the correct numbers. Some numbers not reported in 2007 were added to the dataset. *Adult lbs/acre only. Since it does not include weight of YOY it will be an underestimate of the total lbs/acre, and was not included in the fall mean estimates.

Stream	East Indian Creek
Tributary number	M-032
Report Date	December 23, 2009

Table 2. Trends in brook trout population metrics for East Indian Creek, years 1975, 1980-2009

Station	River Mile	Similar Reach	Date	No./mile (Adult)	No./mile (Recruits)	No./mile (≥10 in.)	lbs/acre (all sizes)
7	7.0	2	9/21/2009	935	4,388	8	148.92
7	7.0	2	9/22/2008	988	4,474	69	171.50
7	7.0	2	9/24/2007	1,380	1,332	15	110.49
7	7.0	2	10/3/2006	898	7,080	168	292.34
7	7.0	2	9/26/2005	784	938	48	127.51
7	7.0	2	9/13/2004	331	1,366	48	86.3
7	7.0	2	9/25/2003	261	1,707	24	83.42
7	7.0	2	9/17/2002	282	293	64	36
7	7.0	2	9/19/2001	277	1,429	27	83.25
7	7.0	2	9/25/2000	698	2,709	0	167.5
7	7.0	2	9/23/1999	684	3,063	16	151.3
7	7.0	2	9/25/1998	1,001	2,611	40	198.58
7	7.0	2	9/29/1997	522	4,757	41	220.4
7	7.0	2	9/27/1996	1,075	715	49	188.1
7	7.0	2	10/5/1995	876	1,970	104	180*
7	7.0	2	9/30/1994	813	1,162	25	97*
7	7.0	2	9/15/1993	413	1,047	0	48*
7	7.0	2	10/22/1992	624	1,028	-	72*
7	7.0	2	9/4/1991	331	2,268	-	31*
7	7.0	2	9/26/1990	64	1,056	-	7*
7	7.0	2	10/9/1989	202	294	-	17*
7	7.0	2	9/26/1988	459	386	-	54*
7	7.0	2	9/9/1987	406	349	-	45*
7	7.0	2	9/18/1986	219	1,015	-	38*
7	7.0	2	9/04/1985	633	390	-	45*
7	7.0	2	9/17/1984	195	65	-	22*
7	7.0	2	9/14/1983	114	57	-	19*
7	7.0	2	9/7/1982	138	65	0	13*
7	7.0	2	9/4/1981	41	8	-	10*
7	7.0	2	1980	28	110	-	12*
7	7.0	2	10/30/1975	0	0	0	0
			Fall Mean	506	1,553	39	137.7
7	7.0	2	3/19/2002	90	555	8	30.36
7	7.0	2	3/26/1998	1,429	2,288	121	313.51
			Spring Mean	760	1,422	65	171.9

NOTE: Estimates were refigured in 2007 and are believed to be the correct numbers. Some numbers not reported in 2007 were added to the dataset. *Adult lbs/acre only. Since it does not include weight of YOY it will be an underestimate of the total lbs/acre, and was not included in the fall mean estimates.

Table 3. Trends in white sucker population metrics for East Indian Creek, years 2007-2009

Station	River Mile	Similar Reach	Date	No./mile (Adult)	No./mile (Recruits)
7	7.0	2	9/21/2009	31	0
7	7.0	2	9/22/2008	98	0
7	7.0	2	9/24/2007	82	62
			Fall Mean	90	31

Table 4. Trends in Index of Biotic Integrity (Mundahl and Simon 1998), and Minnesota Stream Habitat Assessment (Fisheries Stream Survey Manual 2007) or Quality Habitat Evaluation Index (QHEI) scores for East Indian Creek, years 2003-2009

Station	Similar Reach	Date	IBI	Land Use	Riparian Zone	Instream Substrate	Instream Cover	Channel Morphology	Final Score
7	2	9/21/2009	95	4	8.5	16.4	15	25	68.9
7	2	9/22/2008	95	4	8	17	10	23	62
7	2	9/24/2007	60	4	8	15.7	7	22	56.7
7	2	10/3/2006	80	-	-	-	-	-	-
7	2	9/26/2005	85	5*	12*	14*	14*	23*	68*
7	2	9/13/2004	100	-	-	-	-	-	-
7	2	9/25/2003	85	-	-	-	-	-	-

*Quality Habitat Evaluation Index (QHEI) scores were used for this habitat assessment and were calculated differently than the MSHA scores

References

Fisheries Stream Survey Manual. 2007. Special Publication No. 165. Minnesota Department of Natural Resources.

Mundahl, N.D., and T.P. Simon. 1998. Development and application of an index of biotic integrity for coldwater streams of the upper Midwestern United States. Pages 383-415 In Thomas P. Simon (ed.). Assessing the Sustainability and Biological Integrity of Water Resources Using Fish Communities. CRC Press, Boca Raton, Florida.

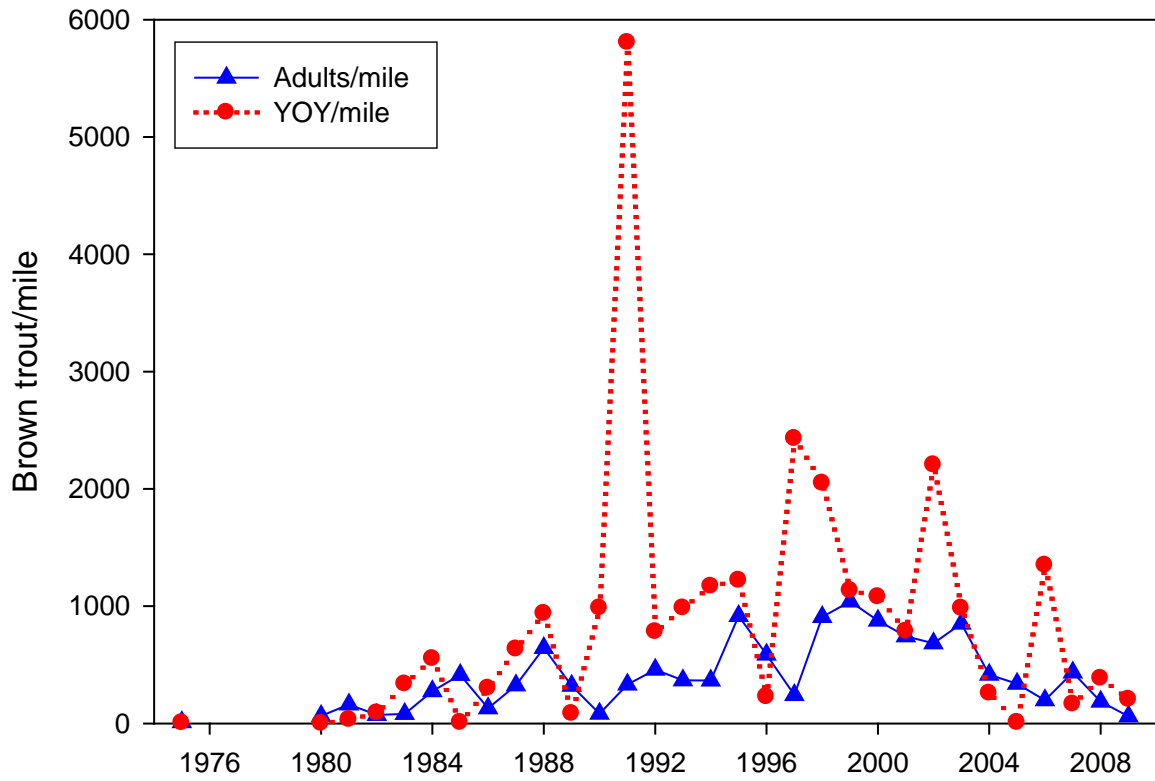


Figure 1. Abundance of brown trout adults and recruits (YOY) in East Indian Creek, fall 1975-2009

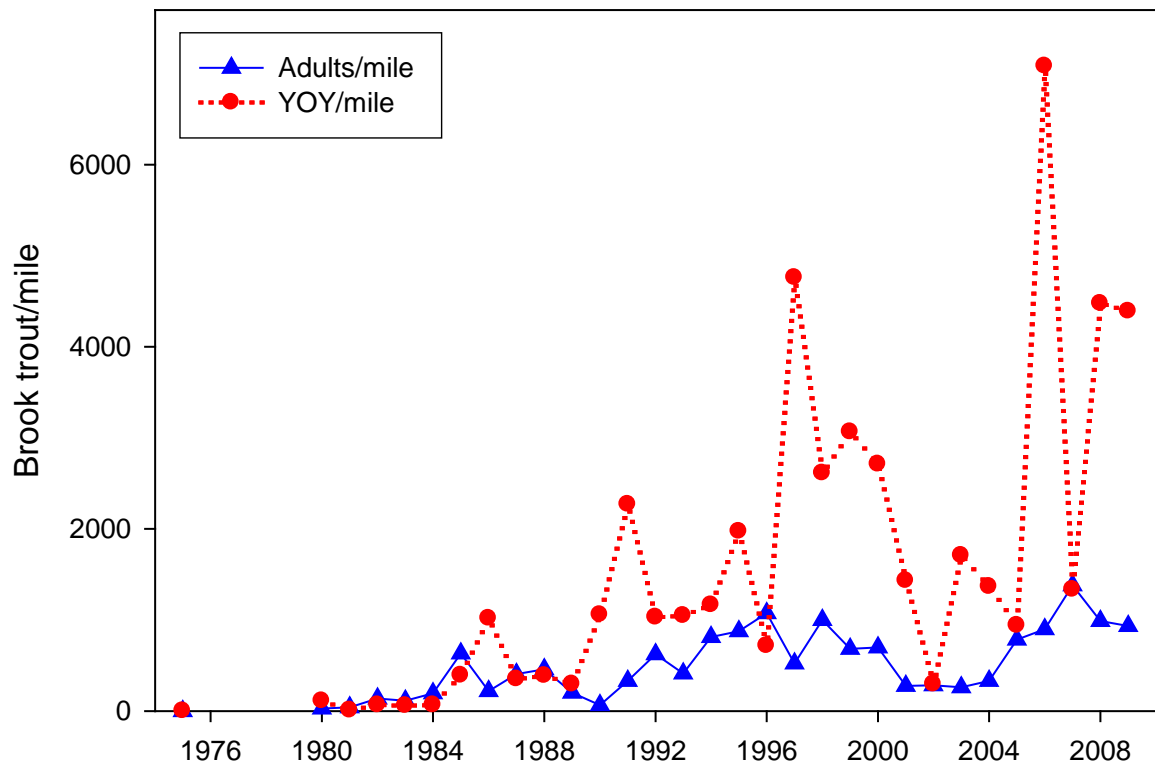


Figure 2. Abundance of brook trout adults and recruits (YOY) in East Indian Creek, fall 1975-2009

East Indian Creek

M-32

Date: December 10, 2009
 Map For: Population Assessment
 Prepared By: Jim Melander
 Fisheries Office: Lanesboro
 Mouth TRS: 109-9-19
 Source TRS: 109-10-31
 Counties: Wabasha



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 MN Dept of Natural Resources
 Division of Fisheries

Electrofishing Station Location



0 0.4 0.8 1.2 Miles

